M-AUDIO

Profire 610

English

User Guide

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Introduction

Congratulations on your purchase of the M-Audio ProFire 610 audio interface. ProFire 610 is part of M-Audio's award winning series of FireWire¹-based digital recording systems and features solid hardware design, robust driver technology, and a powerful Control Panel application to help you capture your best performances with the highest possible fidelity.

This rugged interface includes many features found on the flagship ProFire 2626 interface including a powerful DSP-based monitor mixer, high quality preamplifiers featuring Octane™ technology, two discrete headphone

outputs, and an assignable Master Volume Control knob to facilitate many kinds of recording and mixing. Furthermore, the portable design and bus powered operation of ProFire 610 allow you to make professional-grade recordings anywhere—at the studio or on the road.

Even if you're an experienced digital recording enthusiast, please take a moment to read through this User Guide and familiarize yourself with the features and operation of ProFire 610. You may also want to refer to your audio software's documentation to better understand how ProFire 610's features are integrated with the program. Your experience and enjoyment of your ProFire 610 will be greatly enhanced by a good working knowledge of your audio software.

¹ About "1394" "iLink" and "FireWire":

Some computer manufacturers may use a different nomenclature to refer to their FireWire connections, such as "iLink", "IEEE 1394" or simply "1394." These ports carry the same data and ProFire 610 can be connected to any of these ports.

NOTE: Do not connect or disconnect bus-powered M-Audio, or 3rd party FireWire devices while your computer is running (i.e. no "hot-plugging"). Make all FireWire cable connections while the computer is powered off. See page 7 for more information about this topic.

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What's in the Box

Your ProFire 610 package contains:

- ProFire 610 interface
- Printed Quick Start Guide
- 6-pin to 6-pin FireWire cable
- 6-pin to 4-pin FireWire cable
- FireWire Series CD-ROM containing drivers and documentation
- Software Bundle CD-ROM
- 12VDC 2A Power Supply



ProFire 610 Features

- · Six-input, ten-output audio configuration
- Up to 24-bit/192kHz operation
- Two high-quality mic/instrument preamps featuring Octane™ technology, LED meters, and phantom power
- Two front-panel XLR/TS Combo jacks accepting mic or instrument level inputs
- Two rear-panel 1/4" TRS balanced line inputs
- Eight rear-panel 1/4" TRS balanced line outputs
- Two independent 1/4" headphone outputs with volume control knobs for each output
- S/PDIF In/Out
- MIDI In/Out
- Powerful onboard DSP providing five near-zero latency 16x2 monitor mixers
- User-assignable Master Volume control
- Functions as a standalone two-channel mic preamp and A/D D/A converter

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Minimum System Requirements

Minimum system requirements can be found on the ProFire 610 product packaging as well as the M-Audio website.

A Note about Operating System Updates: Please check the M-Audio driver download page at http://www.m-audio.com/drivers for the availability of an updated driver before you decide to install operating system updates.

Before new M-Audio device drivers are released, they are tested for use with the operating system versions that are available at that time. When updates for an operating system are released by Microsoft or Apple, all M-Audio device drivers have to be re-tested and possibly updated to ensure proper operation.

M-Audio recommends refraining from installing operating system updates until a driver has been posted to the M-Audio website for that specific operating system.

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Controls and Connectors

Front Panel Descriptions



- 1. **Mic / Inst Input Combo Jack (Mic / Inst) -** Balanced mic-level and unbalanced instrument-level combo inputs. These combo connectors will accept a standard three-pin XLR plug or a 1/4" TS connector and will appear as the first pair of inputs (e.g. inputs 1/2) in your audio application. Input levels are controlled by the corresponding Gain knobs.
- Signal/Clip Indicators (Clip) The green LED indicates the presence of a signal at the corresponding analog
 input while the red LED indicates "clipping" or distortion at the input. Use these LED meters to set levels for the first
 two analog inputs.
- 3. **Gain Knob (Gain) -** The preamp level for the front panel inputs is adjusted with this knob. It also has a push/pull function which engages a 20dB pad when set to the "out" (pulled) position.
- 4. **Headphone Volume Knobs (Level) -** Each of these two knobs controls the volume level of the associated headphone output jack.
- 5. **Headphone Outputs (1 ^ 2) -** These two 1/4" (TRS) headphone output jacks operate independently from each other. The first headphone jack outputs the same audio signal as rear-panel outputs 1/2 while the second headphone jack outputs the same audio signal as rear-panel outputs 3/4.
- 6. Phantom Power Button and LED (48V) This button applies +48V phantom power to the XLR inputs on the front of the interface. The LED next to the button illuminates when phantom power is being sent to the XLR inputs.
- 7. Power LED Indicator The blue Power LED glows steadily when the device is receiving power via the FireWire bus or the external power supply. The LED will blink off and on if the unit is set to external sync and not receiving a valid clock signal.
- 8. **Power Button (**①**)** This button switches the interface on and off.

About Phantom Power:

Be mindful when engaging phantom power since not all microphones require phantom power to operate. For example, most dynamic microphones do not require any phantom power whereas condenser microphones usually do. Some vintage ribbon microphones may be damaged if phantom power is applied to them. Always consult your microphone's manual before applying phantom power.

9. **Master Volume** () - This knob controls the analog output levels of ProFire 610. Turning the knob clockwise will increase the output level while turning it counterclockwise will reduce the output level.

By default, this knob is assigned to control analog outputs 1/2, however, the Control Panel application provides the option of setting the Master Volume knob to control any combination of analog output pairs (i.e., 1/2, 3/4, 5/6, or 7/8). This includes the ability to control the level of all eight analog outputs simultaneously. This feature has been implemented to facilitate many kinds of stereo and surround mixing scenarios.

See the Control Panel section of this User Guide for more information about how to configure and use the Master Volume knob.

NOTE: If this knob is assigned to control analog output pairs 1/2 or 3/4, it will also affect the level of the first and second headphone outputs, respectively. The section "Connecting the Analog Outputs" includes a tip on how to configure the interface to give you three separate volume control knobs (i.e., one knob for each headphone output and the Master Volume knob to control your speakers). See page 10 of this guide for more information about this topic.

! WARNING: Unchecking one of the Master Volume Knob boxes allows its corresponding outputs to play at full volume (i.e., without any attenuation). This may result in very loud signals being sent to your speakers, headphone amplifiers, or other equipment. Be mindful of your outgoing levels anytime you uncheck one of these boxes to avoid potentially damaging your equipment (or hearing). If you wish to leave these boxes unchecked in order to allow full, unattenuated signals to play through the interface, it is strongly recommended that you have an external provision for controlling your levels (such as a an external mixer).

Rear Panel Descriptions



10. **Power Input (- +) -** Connect the 12VDC 2A power supply here when using ProFire 610 with a four-pin FireWire connection, or if your computer does not provide sufficient bus power on a 6-pin connection. If your computer can provide power over a 6-pin connection, it is not necessary to use the included power supply.

Use only the power supply provided with the interface or a power supply with equivalent specifications.

- 11. **FireWire Connectors** () Connect your computer to ProFire 610 using one of these FireWire ports and the included FireWire cable. The second FireWire port allows additional equipment, such as an external hard drive, to be connected in a daisy-chain to the computer. Do not connect the second FireWire port to another computer. ProFire 610 does not offer any kind of FireWire networking capabilities and attaching the interface to two computers may result in damage to the interface and/or the computers.
 - **! IMPORTANT**: Do not connect or disconnect bus-powered M-Audio, or 3rd party FireWire devices while your computer is running (i.e. no "hot-plugging"). Make all FireWire cable connections while the computer is powered off.

Reports have come to our attention of isolated problems when hot-plugging IEEE 1394 (aka "FireWire") devices, including, but not limited to devices of the M-Audio FireWire family.

Hot-plugging refers to making connections to 1394/FireWire ports while one or more of the devices (including the computer) are still powered on. There have been rare occurrences when, after hot-plugging, either the FireWire peripheral or the host computer's FireWire port are rendered permanently inoperable.

Please consult the Knowledge Base in the Support section at www.m-audio.com for updates on this important issue.

- 12. **MIDI In and MIDI Out Connectors -** MIDI input and output on standard 5-pin DIN connectors. Connect a MIDI controller keyboard, sound module or other MIDI device to these ports.
- 13. **S/PDIF Coaxial In and Out Connectors -** S/PDIF digital input and output on coaxial RCA connectors. Sample rates of up to 192kHz are supported.
- 14. Line Outputs These 1/4" TRS jacks provide eight channels of discrete balanced or unbalanced analog output.
- 15. **Line Inputs -** These two 1/4" TRS jacks provide two channels of balanced or unbalanced analog input. These will appear as the second pair of inputs (e.g. inputs 3/4) in your audio application.

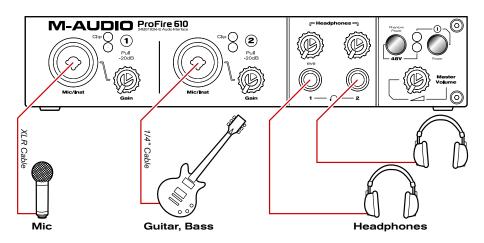
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Driver Installation

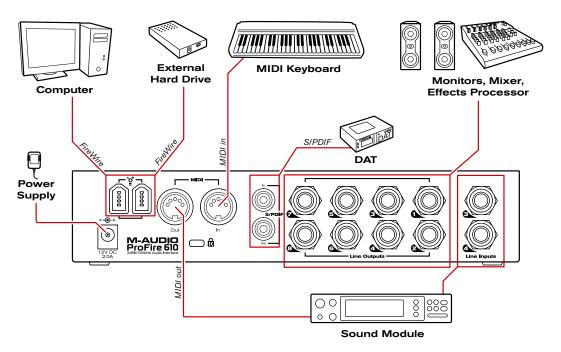
For instructions on installing ProFire 610, please refer to the printed Quick Start Guide.

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Hardware Connections



ProFire 610 front



ProFire 610 rear

Connecting Microphones and/or Instruments

ProFire 610 features two XLR/TS Combo input jacks 1 on its front panel. Microphones or instrument-level sources (electric guitars, basses, etc.) can be connected to these inputs using XLR or 1/4" cables, respectively.

If you are using microphone(s) that require phantom power, activate the Phantom Power button 9 after the microphone(s) have been connected.

NOTE: Phantom power is only applied to the XLR portion of the front panel combo connectors and does not affect 1/4" instrument inputs in any way. Instruments can be connected to the combo inputs regardless of the status of the phantom power switch.

Connecting Line-Level Inputs

ProFire 610 can simultaneously record audio from up to two line-level sources. Connect your line level devices to the rear-panel Line Inputs 15.

Digital (S/PDIF) Connections

ProFire 610 features coaxial (RCA) S/PDIF input and output connectors on its rear panel. These jacks can be used to send and receive digital data from any device that has coaxial S/PDIF inputs or outputs.

NOTE: Whenever audio devices are digitally interconnected through S/PDIF, you must set up proper digital synchronization among all of the devices to ensure error free transfer of audio. The "Digital Clocking" section of this guide covers this topic in detail.

Headphone Monitoring

ProFire 610 features two headphone outputs on its front panel. The first headphone jack outputs the same audio signal as rear-panel outputs 1/2 while the second headphone jack outputs the same audio signal as rear-panel outputs 3/4.

The first two tabs of the Control Panel (e.g., the "Analog Out 1/2" and "Analog Out 3/4" tabs) are used to set up mixes for these outputs, respectively. Headphone monitoring and mixing is covered in greater detail in the "About Overdub Recording and Monitor Mixing" section of this guide.

NOTE: If the Master Volume knob 9 is assigned to control analog output pairs 1/2 or 3/4, it will also affect the level of the first and second headphone outputs, respectively.

Connecting the Analog Outputs

Connect the rear-panel line outputs 13 to a mixing console, amplifier or powered monitors. By default, analog output pair 1/2 is controlled by the front-panel Master Volume knob 6, however, this knob can be assigned to control other outputs pairs through the ProFire 610 Control Panel.

! CAUTION: Analog output streams that are not assigned to be controlled by the Master Volume knob will be sent to the analog outputs at maximum level.

✓ TIP: To control the level of the main monitor mix without affecting the level at the headphone outputs, assign the Master Volume knob to either analog outputs 5/6 or 7/8 and use those outputs for your main monitors. This prevents the Master Volume Knob from influencing the levels of headphone outputs 1 and 2 and effectively provides front panel volume controls for three unique stereo outputs.

If you already have a way of controlling the main monitor mix level (e.g. through the use of an external mixer), another good use for the assignable Master Volume Knob is as an auxiliary send. Simply connect one of the analog output pairs to an outboard effects unit and assign the Master Volume Knob to the respective channels. Bring the outboard effect's outputs back into the ProFire 610 interface using line inputs 3 and 4 as the auxiliary return and use the Master Volume Knob to control the auxiliary send level.



Software Control Panel

The ProFire 610 driver software provides a simple but powerful interface to connect with your computer's Digital Audio Workstation software. The Control Panel provides five independent multi-channel mixers, featuring six input channels sourced from the physical inputs, as well as ten output channels from your audio software. Each mixer is routed to its own pair of hardware outputs, allowing five unique mixes to be created from any of the hardware inputs and software returns.

The ProFire 610 Control Panel is installed in your system when you complete the driver installation procedure. To open the Control Panel:

- Windows XP/Vista users: A small M-Audio logo will be placed in the system tray, generally located at the bottom of your Windows desktop. Double click this icon to open the Control Panel.
- Mac OS X users: The ProFire 610 Control Panel can be found in System Preferences, under "Other."

NOTE: The ProFire 610 Control Panel can also be opened from an ASIO compliant music program's audio setup page.

Mixer Tabs



This section of the User Guide provides a basic overview of the ProFire 610 monitor mixers and describes the various buttons, knobs, and sliders found on the mixer pages. Refer to the "About Overdub Recording and Monitor Mixing" section of this guide for an in-depth tutorial of how to set up and use the monitor mixers.

Each Mixer tab contains sixteen mono input channels (which can function as eight stereo pairs) and one stereo master mix output channel. Each mixer channel strip contains (from top to bottom): level meter, pan, mute, solo, and level fader. Each adjacent pair of channels also shares a stereo link button. Each of these features is discussed in detail below.

The first six channels (on the left side of the mixer) correspond to the hardware inputs of the interface (i.e., analog inputs 1-4 and S/PDIF L/R). To the right of the hardware inputs are the ten "software return" channels that correspond to the outputs of your audio software. The remaining two channels (on the right side of the mixer) control the mixed output of the selected Monitor Mixer.

The Control Panel features five mixer tabs along the top of the window (Analog Out 1/2, 3/4, 5/6, 7/8, and S/PDIF Out L/R). Use these tabs to select the output for which you'd like to create a monitor mix. For example, select the "Analog Out 7/8" tab to create a monitor mix that routes to analog outputs 7-8.

Note that the two headphone outputs on the front panel of ProFire 610 correspond to Analog Outputs 1/2 and 3/4, respectively. For example, if you would like to create a monitor mix for second headphone output, use the "Analog Output 3/4" tab.

✓ TIP: The first five tabs of the Control Panel (e.g., Analog Output 1/2, 3/4, 5/6, 7/8 and S/PDIF Output L/R) can be renamed by double-clicking on the tab. This allows you to select a customized title for each monitor mix. For example, if the bass player has a headphone mix playing back through Analog Outputs 3-4, this tab can be labeled "Bassist's Mix." Note that renaming a Control Panel tab only changes the name in the Control Panel application itself; tab name changes do not affect your audio application in any way.

Level Meter

Each channel's level meter will display the corresponding channel's input or output level. Each meter offers an indicator to display recent level peaks. The peak indicator's hold time can be configured through the Peak Hold setting in the view menu. This menu is described in the Additional Functions section of this guide.

Pan

The pan control routes each channel to the left or right output bus. Double-clicking, Alt-Clicking (Windows) or Option-Clicking (Mac) on a pan knob will center the knob.

Mute

Clicking the mute button will mute the associated channel's output. The button will illuminate to indicate that the corresponding channel has been muted. Alt-Clicking (Windows) or Option-Clicking (Mac) on a mute button will enable/disable the mute function for all channels within the currently displayed mixer.

Solo

Clicking the solo button will solo the associated channel's output. The button will illuminate to indicate that the corresponding channel has been soloed. All other channels will be muted, except any other channels where the solo button is active. Alt-Clicking (Windows) or Option-Clicking (Mac) on a solo button will enable/disable the solo function for all channels within the currently displayed mixer.

Stereo Link

Clicking the stereo link button causes both of the corresponding adjacent channels to be controlled by either channel's fader and mute/solo buttons. Alt-Clicking (Windows) or Option-Clicking (Mac) on a link button will link/unlink all channels within the currently displayed mixer.

Level Fader

The Level Fader controls the output level for its corresponding channel. Double-clicking or Alt/Option-Clicking on a channel fader will set the fader to unity gain.

Channel Name

The name displayed at the bottom of each channel strip can be changed by clicking on the field. Once you have entered a new name, press the enter/return key to confirm the new channel name.

Note that changing channel names only affects the appearance of the channel names within the Control Panel mixer tabs—this feature does not affect your audio application in any way. Also note that renaming a channel in one mixer tab results in the new name appearing in all of the remaining mixer tabs.

✓ **TIP**: Once you have finished naming a channel, pressing the tab key allows you to immediately jump to the next channel and begin naming it. This lets you name all of the mixer channels quickly.

Settings Tab



Hosted Mode - Sync Source

This drop-down menu lets you select the digital synchronization source of the interface when ProFire 610 is in Hosted Mode. The menu selects between ProFire 610 internal sync or external sync via an incoming S/PDIF signal.

AHosted Mode - Sample Rate

This drop-down menu sets the sample rate of ProFire 610. Note that when using the interface with an ASIO or CoreAudio application, the sample rate can also be determined by your audio application. This parameter may not be editable from within the ProFire 610 Control Panel if your audio application is running. In this case, any changes to the sample rate must be made through the audio application itself. If the application does not provide a way to set the sample rate, quit the application, then change the sample rate through the ProFire 610 Control Panel.

If ProFire 610 is set to External sync, this menu will display the current incoming sample rate, and selection will be disabled. If the unit is set to External sync and an error is detected in the incoming sample rate, the field below the menu will display one of the following two messages:

- Unsupported an unsupported sample rate is detected
- Unlocked no valid clock source is detected

If External sync is selected and a sync error is detected, the Power LED 8 will blink.

Hosted Mode - ASIO / WDM Buffer Size

Windows Only

Latency is defined as the time it takes for your input signal to pass through your audio software and appear at the outputs. This latency can result in a delay that is undesirable when overdubbing to existing tracks.

This drop-down menu lets you select the size of the buffer in samples. Smaller buffer sizes result in lower latency, but may not function well with slower systems, causing clicks, pops and dropouts in the audio playback.

The default buffer size is 256 samples. If you are experiencing clicks and pops in your audio, try increasing the buffer size.

Standalone Mode - Sync Source

This drop-down menu lets you select the digital clock synchronization source while operating in Standalone Mode. You can choose to synchronize to the internal clock of ProFire 610 or to have the interface lock to an incoming S/PDIF signal.

Standalone Mode - Sample Rate

This drop-down menu lets you select the sampling rate of the interface when operating in Standalone Mode. Supported sample rates are 44.1, 48, 88.2, 96, 176.4 and 192 kHz.

If ProFire 610 is set to External Sync in Standalone Mode, the Sample Rate menu will display "Auto" and the interface will automatically lock to the incoming S/PDIF signal's sample rate.

About External Clock

Digital audio is based on samples. For example, a digital recording at a sample rate of 44.1 kHz contains 44,100 samples, or digital "snapshots," per second. Each digital audio device has its own internal clock, or crystal, to generate and control the exact rate and timing of these samples during every second. In order for two or more digital audio devices to function together, only one of their clocks can be in control (the Master), while any other devices must be synchronized to that device's clock (the Slave). Otherwise, the resulting audio will sound distorted, play at the wrong speed, or have clicks and pops.

You can set ProFire 610 to run as the Clock Master ("Internal") when digitally connected with other digital audio devices:

Connect ProFire 610's S/PDIF output to the S/PDIF input of another digital audio device and configure that device to synchronize to its S/PDIF input (making it the word clock Slave).

Alternatively, you can set another device to act as the Clock Master and designate ProFire 610 to run as the word clock slave:

Connect the S/PDIF output of your digital audio device to the S/PDIF input of ProFire 610. Select "External - S/PDIF" as the clock source setting on the Settings tab of the Control Panel. ProFire 610 now runs in sync to the digital S/PDIF signal generated by the other device.

If External sync is selected and a sync error is detected, the Power LED 8 will blink.

Mixers Active at Sample Rates Above 96 kHz

When operating at sampling rates of 176.4 or 192 kHz, ProFire 610 can use two of its available Monitor Mixers. These two drop-down menus allow you to select which two mixers will remain active at sampling rates above 96 kHz. For example, if you would like to use the "Analog Out 1/2" and "S/PDIF Out L/R" Monitor Mixer tabs, select them from the "Mixer 1" and "Mixer 2" drop-down menus.

Note that when operating at sampling rates of 176.4 or 192 kHz, signals can still be sent to outputs that are not selected in these drop-down menus. However, these outputs will not feature any monitor mixing capabilities (i.e., the outputs of your audio software will be routed directly to the output and you will not be able to modify your signals before they reach the physical output ports).

Master Volume Knob

These checkboxes determine which analog output pair(s) will be affected by the Master Volume knob 6 on the front panel of the interface: If a box is checked, the volume level of its corresponding outputs will be controlled by the Master Volume knob; if a box is left unchecked, the outputs will play at full volume regardless of the position of the Master Volume knob.

This feature gives ProFire 610 a great deal of flexibility in how it can be used. For example, in multi-channel "surround" mixing scenarios, you can use the Master Volume knob to simultaneously set the level of all speakers by checking the outputs that are connected to your speakers. On the other hand, if you are mixing in stereo using outboard equipment (i.e., compressors, reverb modules, etc.), you can use the Master Volume knob to set the output level of the "main" outputs (connected to your speakers) while allowing the additional outputs (that are connected to your external equipment) to remain unaffected. This will let you use the Master Volume knob to set the loudness level of your speakers without affecting your external gear.

Note that the Master Volume Knob settings remain active even if the interface is used in Standalone Mode. For example, if the Master Volume knob is assigned to control analog outputs 1-2 in hosted mode, the Master Volume knob will continue to control the levels of analog outputs 1-2 when ProFire 610 is used as a standalone device.

! WARNING: Unchecking one of the Master Volume Knob boxes allows its corresponding outputs to play at full volume (i.e., without any attenuation). This may result in very loud signals being sent to your speakers, headphone amplifiers, or other equipment. Be mindful of your outgoing levels anytime you uncheck one of these boxes to avoid potentially damaging your equipment (or hearing). If you wish to leave these boxes unchecked in order to allow full, unattenuated signals to play through the interface, it is strongly recommended that you have an external provision for controlling your levels (such as an external mixer).

About Tab

This tab contains information on your hardware and current driver software versions. This information may be helpful, should you ever have the occasion to call for technical support. Clicking the buttons at the bottom of the panel will take you to useful links on the M-Audio website, if you are currently online.



Additional Functions

ProFire 610 also features a variety of functions accessible through its File, View, and Help menus. These menus are as follows:

File

This menu allows you to save and load all of the parameters of the Control Panel. Selecting Save or Load will open a dialog window that allows you to browse to a folder of your choice and manage the Control Panel parameter files. This is useful if you'd like to save various configurations (i.e., a multi-tracking setup, a surround mixing setup, etc.) so that you do not have to manually reconfigure your system each time you work on a different type of project.

The "Load Recent" sub-menu lists up to 10 of the most recent Control Panel configurations that you have loaded. The "Clear Menu" option clears the list of recently loaded files (this option does not affect the actual configuration files—it simply removes the recent file names from the sub-menu).

The "Revert to Factory Settings" option allows you to reset all of the ProFire 610 Control Panel parameters to their factory default settings.

Edit

This menu lets you cut, copy and paste track names or entire mixer settings. This menu will appear in one of two ways:

- 1. If a mixer tab name or track name is selected for editing: the Edit menu displays "Cut," "Copy," and "Paste." These options let you cut, copy, and paste selected text just like a text editor.
- 2. If no text field is selected for editing, the items in this menu appear as "Copy Mixer Settings" and "Paste Mixer Settings." These selections let you copy and paste all settings on a mixer tab (including button, knob, and fader positions). This is a helpful feature for users who wish to duplicate monitor mix settings from one tab to another.

✓ TIP: If you have fine-tuned a monitor mix for an artist on the "Analog Out 1/2" tab and would like to create a slightly different monitor mix for another artist on the "Analog Out 3/4" tab, you can simply copy the settings from the first tab to the second using the Edit menu and make small changes. This saves you from having to manually transfer all of the mixer settings before making the changes.

View

This menu lets you change the configuration of the meters at the top of the monitor mixer tabs (i.e., the Analog Out 1/2, 3/4, 5/6, 7/8 and S/PDIF Out L/R tabs).

Meters Only View

Selecting this option hides all of the buttons, knobs, and sliders for each of the monitor mixers and only displays the level meters. This is a useful feature for users who have finished setting up monitor mixes and would like to use only the meters to simply observe incoming signal levels.

Note that selecting this option hides the buttons, knobs, and sliders in the Control Panel but does not affect their settings in any way.

Meters are Displayed:

This section determines the behavior of the meters of the ProFire 610 monitor mixers.

Pre-fader – When this parameter is set to "Pre-fader" the meters will display the level of a signal before it passes the fader. This allows signal levels to be displayed regardless of the fader positions within the monitor mixers (i.e., a fader can be all the way down and no sound will be heard from the mixer's output, but you can still see if there is any activity on that input).

Post-fader – This setting configures the meters to show levels after signal has passed through the faders. In this configuration, fader positions will affect the meters. For example, a fader that is all the way down will result in no signal being displayed on its meter.

Peak Hold

The meters of the ProFire 610 monitor mixers feature a "peak hold" function designed to assist in finding the loudest transients of a signal. These options determine how long the peak indicator remains before resetting:

- Off This setting turns the peak hold function off
- 1 second Peak levels are held for one second
- 3 seconds Peak levels are held for three seconds
- Infinite Peak levels are held until the meters are cleared

✓ TIP: Peak levels can be cleared at any time by clicking the meters in any of the monitor mixers.

Hold Clips Only

When this option is enabled, only the clip indicator (i.e., the top segment of the currently selected monitor mixer meter) is held for the amount of time defined in the "Peak Hold" section (see above). This feature is included to help users spot clipping on the input channels more easily.

Help

This menu gives you convenient access to the support, software update, and product documentation pages on the M-Audio website.

Note that clicking these options will open your web browser and that your computer must have Internet access for these pages to load.

Using ProFire 610

Setting Input Levels

Mic/Inst Inputs

To set gain levels for an analog input, begin by turning the Gain Knob 3 for that channel fully counter-clockwise. While the sound source is playing at its loudest levels, slowly turn the knob clockwise until the red clip indicator 2 begins to illuminate. Then, turn the knob counter-clockwise until the clip indicator no longer illuminates. At this point, you should be ready to record with the optimum gain setting.

If the clip indicator illuminates even at the lowest gain setting (e.g., when the gain knob is fully counterclockwise), pull the gain knob to the "out" position to engage the 20 dB pad before setting gain levels.

Please keep in mind that the red LED indicates that your input is clipping (distorting) digitally. This is not the same kind of analog-style distortion found on guitar amplifiers and effects pedals. Digital distortion is generally considered to be harsh and unmusical and it is recommended that you use these LED meters to avoid this type of clipping.

Line Inputs

Connect the outputs of your line level devices to the rear-panel Line Inputs Is. To maintain the highest possible audio fidelity, the ProFire 610 Line Inputs do not feature attenuation or "trim" circuitry and are connected directly to the A/D converter. This means that any adjustments to that signal level must be made at the source. If you have an output level control on the device that you've connected to the line inputs, adjust that output level control to change the recording level. Most recording software will allow you to add gain to a recording that is made at a level that is initially too low, but be careful that the recording level is not reaching digital clipping (going into the red) while recording. You can monitor your signal levels by viewing the input meters on any of the Monitor Mixer tabs of the Control Panel.

S/PDIF inputs

The S/PDIF inputs 13 on ProFire 610 can receive two channels of digital audio on input channels 9/10. Like the Line Inputs mentioned above, the signal level that you receive at the S/PDIF inputs will be the signal level that you record. Adjustments to the S/PDIF input levels must be made at the source. If your S/PDIF device has an output level control, use that control to adjust the recording level. Use the meters on any of the Monitor Mixer tabs to view your incoming levels.

See the "Digital Clocking" and "Sync Source" sections of this User Guide for more information on digital synchronization.

Configuring your Audio Software

Once the ProFire 610 drivers are installed, you may need to configure your audio software before you can begin recording and mixing. This configuration process varies from one application to another, but in general, there are three things you may need to do:

Selecting ProFire 610 as the audio device

You must make sure that your software is configured to use ProFire 610 as its audio input and output device. This is because your computer may have more than one audio interface attached (such as a built-in sound card running along side your ProFire 610), and your software may not use ProFire 610 by default.

This is usually done through the program's "Settings" or "Preferences" menu, however, you may want to refer to your application's user guide if you're not sure how to change this setting.

Routing your software outputs

Once ProFire 610 is selected as an audio input/output device, you may need to configure your software to send and receive signals from the proper inputs and outputs of the interface. For example, if you have connected a synthesizer to inputs 3/4 of the interface, you will need to set your audio software (or a specific "track" within your software) to receive signals from "ProFire 610 Analog In 3-4." Also, you will need to ensure that your audio application's outputs are being sent to the correct hardware outputs of ProFire 610.

NOTE: All of your audio application's output signals pass through the ProFire 610 monitor mixers before reaching the actual output port on the back of the interface. By default, the mixer allows all signals to pass through. However, if you have made changes to the Monitor Mixer tabs, you may need to check the mixer tabs and make sure that input and output channels are not muted, turned down, or otherwise keeping signals from reaching the output ports.

Setting the sample rate and bit depth of your session

ProFire 610 can operate at many sampling rates (44.1, 48, 88.2, 96, 176.4, and 192kHz) and two different bit-depths (16 or 24-bit) in order to accommodate a wide variety of projects. It is recommended that you decide on a sample rate and bit-depth for your project before you begin recording to maximize fidelity and avoid potentially time consuming format conversions.

If you are unsure about what settings to use, the following general guidelines should help you decide on a format:

Music Projects:

If your final mix is intended to be played back on a CD player, portable media player (i.e., MP3 player), or other "music" device, it is recommended that you work at 24-bit resolution with a sampling rate of 44.1k, 88.2k, or 176.4k.

Video Projects:

If your final mix is intended to be played back on a DVD player, TV show, or other "video" device, it is recommended that you work at 24-bit resolution with sampling rates of 48k, 96k, or 192k.

✓ **TIP**: Keep in mind that it is always possible to convert from one format to another with little or no audible degradation in sound quality. However, it is not possible to raise the fidelity of your already recorded files by increasing the sample rate or bit-depth. Therefore, if you are not sure about what rate to work at, try to use higher sample rates and bit-depths if your computer's hard drive and processor allow you to work at these rates.

In most cases, you can set the sample rate and bit depth of your project from within the audio application itself. This configuration varies from program to program, but these settings are usually found in the "Setup" or "Project Setup" menus of your program.

If your audio application does not have a configuration page or does not have provisions for changing sample rates, use the ProFire 610 Control Panel to make these changes. You may need to close your audio application before the Control Panel allows you to make any changes.

NOTE: If you are recording or playing back to an external digital device through the S/PDIF ports, be sure that you have set up proper clocking. Clocking is covered in detail in the "Digital Clocking" section of this guide.

About Overdub Recording and Monitor Mixing

Much of the popular music that you hear today is created using a method called "overdub" recording. Overdub recording allows artists to record their music while listening to previously recorded parts of the song. For example, a vocalist may record his or her parts while listening to the previously recorded guitar, bass, and drum parts in his/her headphones. This method is popular because each recorded part is completely separate from the other parts and can be more easily edited and mixed into a "polished" song. For example, if the guitarist is not happy with the solo, it is possible to edit problematic notes, re-record the entire solo, or even "splice" together the best parts of multiple takes to create one seamless performance. This kind of detailed editing is generally not possible with "live" recording situations in which all sounds are captured at once.

To record overdubs, each artist must have a monitor or "cue" mix sent to his/her headphones. This mix contains the previously recorded tracks combined with the "live" signal that is being recorded. For example, the vocalist would need to hear the guitar, bass, and drum tracks along with his/her own vocal performance as it is being recorded into the computer.

ProFire 610 allows you to create up to five stereo monitor mixes using the first five tabs of the Control Panel. Each tab controls a stereo mixer with 16 inputs (six hardware inputs plus ten outputs from your audio software). Each tab routes signals to a separate pair of outputs as shown in the following table:

Tab Name: 2	The output of this tab is routed to:
Analog Out 1/2	Hardware Output 1/2 and Headphone Output 1
Analog Out 3/4	Hardware Output 3/4 and Headphone Output 2
Analog Out 5/6	Hardware Output 5/6
Analog Out 7/8	Hardware Output 7/8
S/PDIF Out L/R	S/PDIF Output

² Tab names can be changed by double-clicking the title and entering a new name. Tabs with customized names will appear differently than the example scenarios in this guide.

Using the Monitor Mixer

To use the ProFire 610 Monitor Mixer:

 Select the tab that corresponds to the hardware outputs to which you would like to send your monitor mix. For example, if you wish to create a mix that routes to analog outputs 7/8, select the "Analog Out 7/8" tab.

✓ TIP: Keep in mind that the first and second headphone outputs are hardwired to analog outputs 1/2 and 3/4. If you would like to route your monitor mixes to the first or second headphone outputs, select the "Analog Out 1/2" or "Analog Out 3/4" tabs, respectively.

- 2. Adjust the level faders for the hardware input and software return channels to create a comfortable monitor mix for the listener.
 - The six channels on the left side of the mixer represent the "live" hardware inputs. For example if you have connected a microphone and guitar to the first two inputs, signals from these devices will appear on channels one and two of the mixer.
 - The ten "Software Return" channels correspond to the outputs of your audio application.³
 - The last two channels on the right side represent the monitor mixer's master outputs that are sent to the mixer's associated hardware output pair (on the rear-panel of ProFire 610).
 - ✓ Keep in mind that this mixer is for monitoring purposes only. All signals received at the hardware inputs are also sent directly to the recording application without being altered. The Monitor Mixer receives duplicates of these input signals to allow you to create a near-zero latency monitor mix. Changes made to the monitor mixer do not affect your recordings (or your audio software), since the Monitor Mixer's output is not actually being recorded. For example, if the singer would prefer to not hear guitars while recording, the guitar channel of the singer's monitor mixer can simply be muted without affecting the recording application in any way.
- 3. Use the pan knob to adjust the position of a sound between the left and right channels. Note that double-clicking a knob will "center" it.

4. If you are routing signals to Headphone Outputs 1 and 2, make sure the Headphone Level Knobs 4 are set properly. Alternatively, if you are routing monitor mixes to external headphone amplifiers, make sure those amplifiers are set properly.

³ When selecting output channels 1/2 from your audio application, the signal is not sent directly to the physical hardware outputs on the rear-panel of ProFire 610; The signal is first sent to the Analog 1/2 tab of the Control Panel.

By default, the monitor mixer on this Control Panel tab then passes the unaltered signal on to hardware outputs 1/2. However, this tab gives you additional control over signals sent to hardware outputs 1/2.

You can use the faders, pan knobs and other controls on the Analog 1/2 tab to add and blend signals from the physical inputs 1-6 and from the remaining ten software return channels and create a stereo mix that is then routed to the rearpanel hardware outputs 1/2.

The same principle applies when selecting output channels 3/4, 5/6, 7/8, or 9/10 from your audio application. These signals are sent to their respective Control Panel tabs "Analog 3/4", "Analog 5/6", "Analog 7/8", and "S/PDIF Out L/R", mixed with other signals if desired, and then routed to their respective analog output pairs 3/4, 5/6, 7/8, or the digital S/PDIF output.

NOTE: When using the ProFire 610 monitor mixer to create low latency monitor mixes, be sure to mute your DAW application's recording channels (or, if possible, turn off the application's monitor mixing functionality altogether) to prevent two separate cue mixes from being created (this can cause undesirable effects such as phasing and slap-back delays). Conversely, if you wish to use your application's own monitor mixing capabilities, you will need to bypass the ProFire 610 monitor mixers to prevent "doublemonitoring" from taking place. This can be done by simply muting the input channels of the monitor mixers that you are using.

Standalone Operation

In addition to operating as an audio interface for your computer, ProFire 610 can also operate without a computer in "standalone mode."

In Standalone mode, ProFire 610 functions as an analog-to-digital (A/D) and digital-to-analog (D/A) converter. Analog inputs 1-2 are "passed through" to analog outputs 1-2 while simultaneously being converted to digital and sent out of the S/PDIF output. The S/PDIF input is converted to analog and sent out of analog outputs 3-4.

To enter Standalone Mode, power down your computer and the ProFire 610 interface, disconnect any FireWire cables attached to the FireWire Connectors [11], and switch on the interface. Keep in mind that all Standalone Mode settings must be made while the interface is still connected to a computer (i.e., ProFire 610 settings cannot be modified while the unit is operating in Standalone Mode). The parameters in the "Standalone Mode" section of the Settings tab of the Control Panel determine how ProFire 610 will function while the interface is operating in Standalone Mode. This is a useful feature as it allows you to set the Standalone Mode settings independently from the hosted settings. This saves you from having to reconfigure the Control Panel each time before you use the interface in Standalone Mode.

For more information on configuring ProFire 610 for standalone operation, refer to the "Settings Tab" section of this user guide.



Digital Clocking

Your computer-based DAW stores and manipulates music as digital samples. Those samples are sent to and from your DAW as "snapshots" of data. These snapshots are all the same size—16-bit or 24-bit, depending on your selected resolution—each with a beginning and an end, and are sent in sequential order (i.e., one after the other) as a stream of data. Think of this data stream as a sentence, made up of a series of words of identical length. The rate at which these words are transmitted (i.e., how many samples are transmitted each second) is known as the "sample rate" of the device. Audio CDs have a sample rate of 44,100 samples per second (known as "44.1 kHz") whereas certain high-end professional audio devices (such as ProFire 610) support very high sample rates (up to 192 kHz) for high audio fidelity.

Precise, accurate timing in sending and receiving those words is critical. Each device in your interconnected digital world must share the same timing in order to communicate correctly—that is, their clocks must be synchronized.

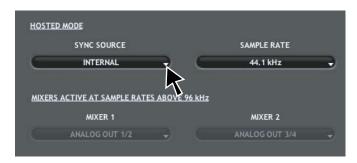
This synchronization is achieved by designating one device as the timing "master," and all other connected devices as "slaves," locking the slaves to the master. Only one device in the chain can be the master, and all other devices must slave to that master. All devices must be running at the same sample rate as well. For example, if the master is running at 44.1 kHz, no other device should be set to any other sample rate.

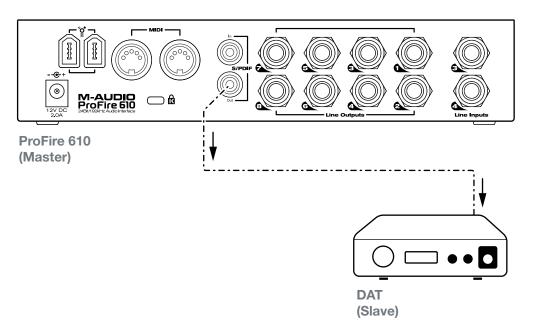
Word Clock is an important part of digital studios but is often overlooked by engineers new to digital recording. It is crucial to set up Word Clock correctly because without precise synchronization between your digital devices, your digital audio signal will be filled with clicks, pops, and white noise, or may not play at all. The following scenarios provide practical digital synchronization examples and setup tips.

Scenario 1: ProFire 610 as Clock Master

By selecting "internal" as the sync source in the Control Panel, you designate ProFire 610 as the clock master. You will then need to select "external" (or "slave" on certain devices) mode on your digitally connected device(s). This is usually an internal menu setting on the external device.

In Figure 1 below, a DAT machine is connected to the coaxial S/PDIF I/O. ProFire 610 is selected as the clock master, and the DAT machine's synchronization source is set to "external" (or "slave").

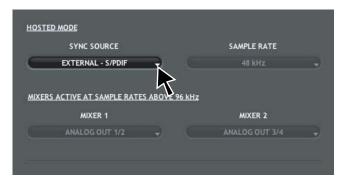


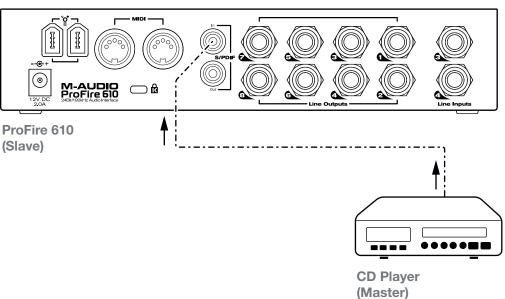


Scenario 2: ProFire 610 Slaved to S/PDIF Input

Certain digital devices, such as consumer CD players, must be used as a clock master and cannot be synchronized to any other devices. This is due to a lack of digital inputs on the CD player (i.e., the device has no way to synchronize to an incoming signal). In this scenario, ProFire 610 can be configured to lock to the CD player (or other external device) through the S/PDIF input.

In Figure 2 below, the CD player is configured as the clock master, while ProFire 610 is configured to synchronize to the S/PDIF input.





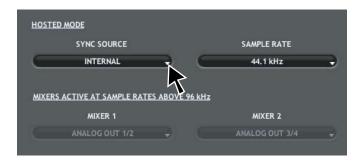
Scenario 3: Creating a Synchronized "Digital Loop"

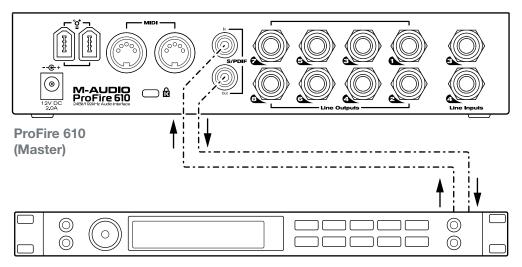
In certain scenarios, you may need to send digital signals to an external device while simultaneously receiving signals from that device. For example, if you have connected an external A/D – D/A converter or digital effects processor to your ProFire 610, you will need to simultaneously send and receive digital audio through the S/PDIF ports.

In this case, either device (i.e., the external digital device or your ProFire 610) can be configured as the clock master while the other device must be configured as the slave device.⁴

⁴ Certain devices automatically lock to any incoming S/PDIF signal and do not give users the option of selecting the clock source of the device. If your 3rd party device operates this way, ProFire 610 should be configured as the clock master for proper operation.

In Figure 3 below, ProFire 610 is configured as the clock source (master) while the digital effects processor synchronizes to the incoming S/PDIF signal.





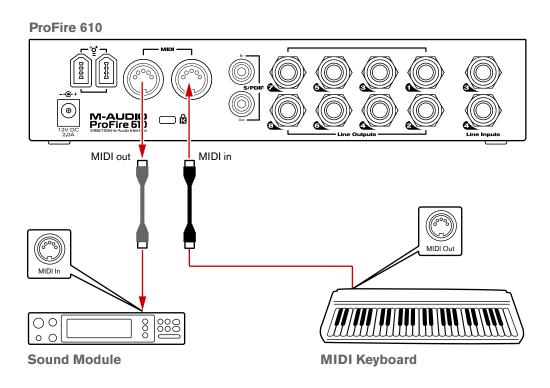
Digital Effects Processor (Slave)

12 MIDI

ProFire 610 provides 16 channels of MIDI I/O over standard 5-pin DIN connectors 12 on the rear panel of the interface. These I/O ports can be used to connect MIDI-compatible devices to your computer such as controller keyboards, drum machines, or sound modules. Alternatively, these ports can be used to send and receive MIDI Time Code (MTC) and other synchronization formats for locking to a hardware or software sequencer.

MIDI is an extensive protocol and covering it in detail is beyond the scope of this guide. If you would like to learn more, please refer to one of the many books and articles that have been written about this subject and are available online or through your local music retailer.

The diagram below demonstrates a scenario in which a controller keyboard and a sound module are connected to ProFire 610:



Troubleshooting

ProFire 610 has been designed to give you high performance and professional-quality audio on a wide range of systems and operating conditions. However, there are a virtually limitless number of operating scenarios, any of which could affect your system's performance. While this section cannot cover all possible issues you may encounter, we would like to offer you some suggestions for dealing with common problems.

In general, it is recommended that you avoid connecting too many FireWire devices to your computer. FireWire is a dependable high-bandwidth protocol that is ideally suited for digital audio. Nonetheless, it's important to remember that audio and multimedia streaming places considerable demands on both your processor and the FireWire bus. Although it is theoretically possible to chain multiple FireWire devices in series, doing so may result in audio recording and playback issues.

If you are having trouble getting audio into or out of your computer, please check the following:

If you have no sound:

- Check to see if the device drivers are properly installed. In Windows, go to the Control Panel and double-click the System icon (under Performance and Maintenance if you're in Category view). Select the Hardware tab and click the Device Manager button. Click the plus sign ("+") next to "Sound, Video and Game Controllers," and locate the ProFire 610 listing. If you see a question mark or exclamation point next to it, or if you don't see it listed, you may need to reinstall the driver software.
- Make sure your audio software has been set up to use ProFire 610. Open your application's audio settings
 page and check to see if the correct ASIO, WDM, or Core Audio drivers have been selected.
- If you're certain ProFire 610 is correctly installed and configured for your audio software, check your signal
 path. Make sure your inputs are routed correctly by verifying that your application is receiving audio signal.
 Make sure your outputs are routed correctly so that your signal is sent to your headphones, amp and/or
 monitors.
- · Check your audio connections to make sure everything is plugged in correctly.
- Check the Signal/Clip indicators 2 to see if input signal is present.
- Check the Control Panel to verify that the output volume levels are turned up, and that signal is present in the input meters.
- Check to see that the power button is enabled, and that the FireWire cable is connected to the unit and the host computer. If you are connected to a 4-pin FireWire port, or if your computer doesn't provide sufficient FireWire bus power, make certain the external power supply is connected.

If you are trying to record a digital input and have no sound:

• If the Power LED Indicator 8 is flashing, this means that the interface is unable to detect a proper clock source. Open the Control Panel and select "S/PDIF" as the Host Mode Sync Source on the Settings tab.

If you are experiencing clicks and pops in your recordings:

• When clocking to an external digital device, make sure the input source on the Settings tab of the Control Panel is set to "External - S/PDIF." See the section about Word Clock for more information.

- Make sure your input levels are not too high, as this can cause distortion and clipping. Check the input level meters in your audio application.
- If you have connected ProFire 610 to a computer through a FireWire hub, try connecting the interface directly to your computer to see if the problem resolves.
- Certain PC motherboards feature network adapters that may conflict with the FireWire port and result in streaming issues for attached FireWire devices. Try disabling your network interface adapter (NIC) to see if the issue resolves. This can usually be done through the system BIOS or the Windows Device Manager. Please refer to your Windows or motherboard documentation to learn how to do this.
- Windows XP/Vista Users: Try increasing the ProFire 610 buffer size. Larger buffer sizes will increase
 latency but will reduce the demands placed on your computer and may improve audio streaming. Buffer
 size settings can usually be changed through your audio application's "setup" or "preferences" menu or the
 ProFire 610 Control Panel.

For more troubleshooting tips, visit the Knowledge Base at www.m-audio.com



Warranty Terms

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WARNING: This product contains chemicals, including lead, known to the State of California to cause cancer, and birth defects or other reproductive harm. **Wash hands after handling**.

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